

APPENDIX C

MICROCOMPUTER APPLICATIONS FOR COASTAL ENGINEERING (MACE) PROGRAM RELATED TO WAVES AND COASTAL FLOODING

C-1. Availability. MACE programs in Microsoft BASIC may be obtained from the Engineering Computer Programs Library Section, Technical Information Center, US Army Engineer Waterways Experiment Station, PO Box 631, Vicksburg, MS 39180-0631.

C-2. Program TIDEHT (MACE-2). Purpose: The program TIDEHT estimates the elevation of the water surface at any time or the time at increments of elevation based on the predictions of National Oceanic and Atmospheric (NOAA) tide tables

C-3. Program TIDEC (MACE-3). Purpose: The program TIDEC estimates the tidal current speed at any time based on the predictions of the NOAA tidal current tables.

C-4. Program WIND (MACE-5). Purpose: The program WIND takes observed wind speeds, the observation elevation, the location of the observation (overwater or overland), the method of wind speed description (fastest-mile or time-averaged speed), the fetch distance, and general knowledge of the condition of the atmospheric boundary layer and calculates the adjusted wind speed or wind stress factor suitable for wave forecasting.

C-5. Program HURWAVES (MACE-8). Purpose: The program HURWAVES estimates the maximum gradient wind speed, the maximum sustained wind speed, the maximum significant wave height, and the maximum significant wave period for slow-moving hurricanes.

C-6. Program WAVFLOOD (MACE-9). Purpose: The program WAVFLOOD applies Camfield's method as presented in the SPM to approximate wave growth or decay over flooded, vegetated land.

C-7. Program SHALWAVE (MACE-10). Purpose: The program SHALWAVE takes water depth, fetch length, and wind stress factor (an option is offered to adjust the measured wind speed if wind stress factor is not available) and estimates the spectrally based significant wave height, the peak spectral wave period, and the minimum wind duration to reach this condition for waves generated in shallow water.

C-8. Program SINWAVES (MACE-11). Purpose: The program SINWAVES applies linear wave theory to calculate wave conditions at varying depths, estimate breaking conditions, and provide functions similar to that of Tables C-1 and C-2 in the SPM.

C-9. Program JONSWAP (MACE-12). Purpose: The program JONSWAP takes a fetch length, wind stress factor (an option is offered to adjust the measured wind speed if wind stress factor is not available), and duration as input and calculates the corresponding JONSWAP deepwater spectrally based significant wave height and the peak spectral period for fetch-limited, duration-limited, or fully developed seas in deep water.

C-10. Program WAVTRANS (MACE-13). Purpose: The program WAVTRANS estimates wave transmission by overtopping given a breakwater cross-section geometry and information on the incident wave conditions.

C-11. Program WAVRUNUP (MACE-14). Purpose: The program WAVRUNUP estimates irregular wave runup heights on rough slopes given incident wave conditions and the structure's slope and slope material.

C-12. Program BWLOSS1 (MACE-15). Purpose: The program BWLOSS1 estimates economic losses due to wave attack as a function of wave height. The program optionally provides an estimate of expected annual economic losses due to wave attack, given the parameters of the long-term (extremal) cumulative probability distribution of significant wave heights.

C-13. Program BWLOSS2 (MACE-16). Purpose: The program BWLOSS2 fits a long-term cumulative probability distribution to transmitted wave height data and estimates expected annual economic losses due to wave attack after a protective breakwater has been built.

C-14. Program WAVDIST (MACE-17). Purpose: The program WAVDIST estimates the parameters of the three commonly used extremal probability distributions for prediction of extreme wave conditions.

C-15. Program FWAVOCUR (MACE-20). Purpose: The program FWAVOCUR determines how frequently extreme wave conditions are expected over a specified time period.